One modern and popular use of ground magnetometer data is to identify field line resonance (FLR) frequencies through the gradient technique and to infer the equatorial mass density of the magnetosphere. Most studies on this topic to date focus on the observations along a single meridian or two, and, as the Earth rotates, the observations constantly advance in local time. This paper presents the sounding of the plasmasphere by using the data from pairs of ground magnetometers that are spaced not only in latitude but also in longitude. It is found that when the separation in local time is one hour or less the azimuthal phase change is not significant enough to affect the detection of FLR frequencies. Hence the FLR observations by a dense two-dimensional array can generate snapshots of the equatorial mass density over a range of L-values and local hours. We examined the FLR sounding of the plasmasphere during several magnetic storms in 2007-2010. The storm-time plasmasphere sometimes exhibits longitudinal, finger-like structure similar to what was observed by the IMAGE satellite. The density profile composed of the FLR sounding by a single meridian chain moving across local hours, however, often presents smoother results because the density in the same flux tube varies slowly with time. These findings suggest a powerful tool to monitor the spatiotemporal variations of plasmaspheric density by the global magnetometer network.